

Consul-General
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REPORT
OF
Forestry Committee
OF THE
HAWAIIAN SUGAR PLANTERS' ASSOCIATION.
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HONOLULU, H. I., NOVEMBER 18TH, 1897.

TO THE PRESIDENT, OFFICERS, AND MEMBERS
OF THE HAWAIIAN SUGAR PLANTERS' ASSOCIATION,
HONOLULU, H. I.,

GENTLEMEN:—I beg to submit for your consideration Reports on Forestry by Mr. David Forbes, of Kukuihaele, Hamakua, Hawaii; Mr. K. S. Gjerdrum of Hana, Maui, and by Dr. Maxwell, Director of the Hawaiian Sugar Planters' Experimental Station. Dr. Maxwell's report was written to President Dole at the latter's request, and was kindly loaned me for the purpose of presenting it at this meeting. It might here be mentioned that although Dr. Maxwell does not claim to be an expert on Forestry and Forest influences, yet it is well known that during his numerous and extended visits to various points on the other Islands he has interested himself in taking observations on this all important subject. His report to President Dole therefor will be of great interest to all who look forward to a systematic preservation of our forests.

The subject as dealt with by Dr. Maxwell was referred by him to Prof. Furnow, Chief of the Division of Forestry in the United States Department of Agriculture, who is perhaps one of the most celebrated experts known on Forestry and Forest influences, and Prof. Furnow's reply to the points taken by Dr. Maxwell I also beg to submit for your serious consideration.

LETTER BY DR. MAXWELL (ex-officio member of Forestry Committee) TO PRESIDENT DOLE.

HON. SANFORD B. DOLE,
President of the Republic of Hawaii,

SIR:—In compliance with the request, made personally by you previous to my last visit to the district of Hawaii, that I should record any observations made in the course of travel

upon the present state of the forests, and upon recent changes in forest areas, and the apparent economic consequences of those changes, I beg to submit to you the following memorandum:

It is not necessary to preface the observations with general remarks upon the relations of forest, rainfall, and the economic value of lands, since these relations have been so amply set forth by the results of exact studies made in other countries, and are generally understood.

The mode, however, in which forest surfaces operate in taking moisture from the air passing over them is not so generally well known; and it is in place to explain that while forest and other altitudes do affect, and possibly draw, atmospheric currents that bear moisture, the main value of the forest is in presenting a cool surface to the moisture-laden air passing over, and thus causing the cooled air to give up a part of its moisture as rain. By way of illustration I may add that I made some readings of the temperature of the air, the surface soil to a depth of six inches, and of the inside of the trunks of trees about nine inches in diameter, and four feet from the ground, when I was in the Hamakua District. The air temperature was 85 degrees, the soil 84 degrees, and the temperature of the trees 72 degrees. The temperature of trees, however, depends upon their size or mass, and the smaller the tree or bush the nearer its temperature comes to that of the air. This example is given in order to guard us against the idea that any vegetable covering with small trees, bush, or scrub, will induce greater precipitation, and to explain that, whilst the bush and ground growths conserve the moisture by preventing a rapid discharge to the sea, it is forest, composed of trees of great height and bulk, which mainly affects the fall of rain.

In the District of Hilo it is not fully evident that an actual decrease in the rainfall is transpiring, but there are ample indications that the water is not conserved as well as formerly, but washes more directly to the ocean; and this change

threatens to affect the plantations, which depend for the fluming of cane upon the steady and uniform flow of the upper water to the sea. However, the signal relation of Hilo to the other districts of the island make it a matter of the greatest moment that the conditions of rainfall in the upper Hilo district shall not be threatened, since if the rains in that district should be affected, the rains from the Hilo region moving towards Hamakua might be reduced to nothing.

I moved to Kohala from the Hamakua district over the Wai-mea plains, and had opportunity to note the further depletion of remnant areas of the original forest.

In Kohala district the abnormal drought of this year has so intensified the consequences of the gradual falling off in the rainfall that appears to have been going on for some time that care is required in order to avoid an extreme view of the situation. I have, however, observed, and have been informed by the best authority, that the forest line upon the slopes declining to Kohala town has been moved back several miles, and within a period not exceeding ten years. This destruction of the front line of the forest, where may be seen dismantled trees rotting on the ground and dying bush, has been mainly caused by mountain cattle, which were allowed to range down to the plantation lines. Today the lower lands are, from want of water, becoming useless for grazing, and the best pastures are upon the higher areas, which a few years ago were so dense and thick with forest and brush that a bullock could hardly penetrate. These observations show how extremely short-sighted and ruinous is the absence of a system of forest control which allows ranches to run their cattle down to the edge of the open lands. The consequences of the moving back of the forest line fall, first, upon the lower lands, in reduced shade and rainfall. But these consequences come almost as quickly upon the ranches themselves; because when the forest shade is gone the pasture and water soon go, and the cattle are moving up in search of water and food, and move up the destruction with them.

On the lower lands, where population appears to have been

greater in the past than it is now, there are palpable indications of a former greater rainfall. There are gulched valleys where the remnants of terraced lands show that vegetation had been carefully and abundantly grown, but which, for some time, have been forsaken and dry, and the flowing streams which fed these lands are dried up and gone.

Unfortunately, the date which can throw any precise light upon a change of rainfall are meagre, and extend back over only a few years. I however, obtained a register of the rainfall in Niulii, which covers the years from 1884 up to the present. If we divide these years into two periods the results are found to be as follows:

Periods.	Average Annual Rainfall.
1884 to 1890 inclusive.....	62.21 inches.
1891 to 1896 “ 	40.30 “

The immediately beneficial results of shutting the cattle out by enclosure of an area running from the plantation head lines several miles back are beyond all question and praise. I have seen these results on Hawaii, above Kukuihaele; and on Maui on lands controlled by the Haiku Sugar Co.; and I am informed of similar results on Kauai on lands lying above Lihue.

You remarked, Mr. President, upon the tracts of land in Kohala known under the name Awini. The situation of those lands was observed by me, but I was unable to visit them. I endeavored, however, to get some idea of the difference in rainfall upon the Awini forest lands, and cleared lands lying at a lower level towards the sea. The data cover only thirteen months, and extend from July 1, 1896 to July 31, 1897.

Awini forest lands.....	63.40 inches.
Lower cleared lands.....	39.19 “

The significance of these data lies less in the simple but notable difference shown, than in the indication that were there no forest upon Awini not only would the Awini rainfall be reduced, but the rainfall below would scarcely be reduced still more. The conditions of this particular location appear to suggest the inadvisability, at the present time, of further

lessening the forest area in the Kohala district by clearing lands; and the general state of the district indicates that steps should at once be taken, either by mutual agreement or by authority, to restore the conditions which appear to have furnished the greater rainfall of an earlier period.

The Awini case may be allowed to raise the whole question of the economic balance of relation between forest and cleared lands. It is quite clear, on the one hand, that a country cannot become of value which is given up to permanent forest. On the other hand, we are admonished by the actual experiences of other countries, and notably by the practice of the United States, that the ruthless destruction of forest, or the disturbance of the relation of forest area to cleared surface, leads to irremediable consequences. Herein lies the whole problem—the adjustment of forest surface to areas of cultivated land. But this is a work requiring very specific knowledge, and the direction of some one expert in the matters of forestry and climatology.

I shall venture to urge the primary importance of expert direction in the matter of forest removal. Trustworthy advice would suggest areas that could be cleared without any cause of damage to contiguous lands, and would show why the reducing of forest area in given localities might be followed by irreparable results. These things, however, are not easily impressed upon communities; and the history of the attitude of the United States Congress towards the forestry question shows that legislation may come too late, which is cruelly emphasised by a report of the present Secretary of Agriculture, recently sent to me, wherein Congress is told that “our virgin coniferous supplies must share the fate of the buffalo, unless a practical application of rational forestry is made” for “the end is visible, and the most sanguine cannot longer hide the truth that within the next decade we shall witness the exhaustion of the greatest staple of our lumber market.”

I have the honor to remain, Mr. President,

Yours most respectfully,

(Signed)

WALTER MAXWELL.

(Copy of letter received by Dr. Maxwell in reply to questions on Forestry from Prof. Furnow, Chief of Forestry, U. S. Department Agriculture.)

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF FORESTRY,

WASHINGTON, D. C., NOVEMBER 3, 1897.

DR. WALTER MAXWELL,
HONOLULU, HAWAII.

DEAR SIR:—It is with greatest interest that I have read your communication received yesterday and I congratulate you on having been instrumental in bringing the necessity of rational treatment of your forest cover to the attention of your Government.

Anything I can do in the way of furnishing argument and advice to strengthen your hand and that of your Government towards establishing a conviction that the interests of agriculture require timely attention to the treatment of forest cover will be cheerfully given.

This problem,—the proper use of soils and natural conditions—as you know, has occupied me for more than a dozen years in the United States and has long ago been solved in Germany, where I had the honor of practicing forestry as an officer of the Prussian Forest Department. I consider the forestry problem one of the most important, with which every Government or Nation has to deal sooner or later; and the earlier it is approached the less damage will be experienced. I recall to you the failure of the Ceylon coffee plantations, of the olive groves in France, attributed to the neglect of this question, and the experience in that and other countries of immense damage to agricultural interests undoubtedly produced by delay in giving attention to this problem of forest protection. That such an important question should not be left to amateurish tinkering and that expert advice in this as in

other matters is productive of better results than the haphazard management of the half educated amateur appears to me self evident. The immense interest involved in sugar and coffee plantations on your Islands can hardly afford to be hazarded by leaving unstudied the relation of their success to surrounding conditions, when expert advice may prevent them from foolish destruction.

I notice that in your argument you have mainly brought forward the influence on rainfall which is claimed for a forest cover. While I hold that under certain conditions such an influence may exist, the proposition is by no means generally proven and the likelihood of its existence in any given case can only be determined by careful analysis of the local conditions. This question is so complicated that it withdraws itself from direct investigation, our present means of demonstrating it are still insufficient; hence this argument for forestry is open to attack without sure defense. We know too little about it.

While I am not personally acquainted with the geographic and climatic conditions on your Islands, I believe that they receive their moisture bearing currents from the East, these currents impinge against the high elevations usually found in the middle of the Islands and being forced upwards, *i.e.*, under less barometric pressure are made to give up their moisture on the windward side, hence the topographic conditions alone would explain the following general distribution of rainfall: a smaller amount in the low lands of the eastern coast; an increasing rainfall with increasing elevation; a dry or rainless country on the western slope, except at higher elevations, the rainfall here depending upon moist western winds, which are probably rare.

There should, if these conditions are as stated, a dense forest growth be found on the higher elevations to the eastward in response to the greater rainfall. This forest growth, it is reasonable to suppose, may if in good, *i.e.*, dense condition, assist in increasing the rainfall over its own area, thus accentuating

the difference between the records of higher and lower altitudes.

The much more forcible argument for retaining hilltops and mountain sides under forest cover lies in the function which this cover plays in the disposal of the fallen precipitation. This influence is purely mechanical, easily understood and easily observed.

There is one other well known detriment to agriculture resulting from forest devastation which has impoverished large areas in France and through which many millions of soil capital are lost annually in our States, namely by erosion and gulying of fields. It is estimated that we lose in the United States annually some 200 square miles of fertile soil by this erosion, besides losing the fertile soil which is washed into the rivers, in addition large expenditures are necessitated to keep the rivers open for navigation. The Mississippi problem is undoubtedly aggravated from this cause.

I shall not weary you further with details, which you can find discussed in my publications from this office sent you.

I come now to your question as to what course it would be well for your Government to take with reference to your forestry problems. I believe in acting upon facts, rather than theories. I would, therefore, advise that before any permanent measures are proposed, an examination of the facts bearing upon the problem be made; in other words to employ an expert or experts to make a physiographic description of the Islands with special reference to these problems.

This office just now is making precisely such a reconnoissance survey for the State of Wisconsin prior to and as a basis for desirable legislation.

Such a survey or inspection, if I understand the conditions of your Islands aright, may be made by a competent man in three or four months. As you may have gathered from the foregoing remarks, it should comprise a statement of the geologic and topographic conditions, the location and condition of forest cover, the relation of the forest areas to agricultural lands, the water supply conditions and such forestry

knowledge as is necessary to form an idea of the ease of re-production and also of such other economic conditions as will aid in forming a judgment of the relative protective values of existing forest areas, the need of their extension and their location.

You will see that not merely a forester, a man skilled in the technique of forest growing, but a man of judgment should be entrusted with such a mission. Perhaps it might be well and expedite the survey to associate with the examiner a resident geologist and perhaps the Surveyor-General, when the three would not only more rapidly get over the ground, but a discussion between them might lead to a more mature judgment as to what recommendations should be made.

After such an examination and report is made, which may be accomplished with an expenditure of less than \$3,000, it will be time to formulate further measures of a permanent character. It may then be found desirable to employ a permanent officer, whose business it is to look after the forestry interests, executing any laws and assisting by advice any efforts of rational management. While I believe that at present the material value of Hawaiian forests is of slight moment, I am inclined to think that the Islands would be able to grow on the soils unfit for agriculture all the wood supplies for their increasing needs, instead of importing the same. Hence the existence of such an officer in this direction too would find ample justification.

My success in persuading the authorities of the State of Wisconsin that this is the rational method of procedure leads me to hope that elsewhere such intelligent action might be had and that the era of doing things right from the start instead of constantly mending mismanaged affairs may have arrived.

With best wishes of success to the budding forestry movement on your Islands.

Sincerely yours,

(Signed)

R. E. FURNOW,
Chief.

FORESTRY AND FOREST PROTECTION AND INDIRECT UTILITY OF FORESTS.

(By Mr. David Forbes of Kukuihaele, Hamakua, Hawaii,
member of Forestry Committee.)

KUKUIHAELE, HAMAKUA, NOV. 15TH, 1897.

W. M. GIFFARD, ESQ.,

CHAIRMAN COMMITTEE ON FORESTRY.

DEAR SIR:—Forestry holds such a vital part in the future welfare of these Islands, that I cannot let this opportunity pass without tendering a few remarks on the subject. As the Government of any country exercises supreme power within the limits of its territory, and makes laws which are binding on all alike, it should also aim at promoting the welfare of its people when free action on part of the individual is detrimental to the interests of the community as a whole.

Applying the foregoing, in the case of forestry, to the Government of Hawaii who control the larger portion of forest lands within its territory, it follows: that where the welfare of the community demands it, and where forests are necessitated by their indirect effects on the Island industries, no effort should be spared to protect and improve the limited area of forest now existing. Thus bringing the state and community into harmony, even if these forests yield directly a low rate of interest on their capital value, the apparent loss will be more than reimbursed by the improvement and flourishing of industries which produce a high taxing capacity of the people.

It seems proven that the preservation of an appropriate percentage of the area of these Islands, as forests, cannot be left entirely to private enterprise, in which case it becomes a duty of the state to interfere. The ever increasing flow of people into these Islands as settlers in search of land for agricultural purposes, and how an existence can be maintained on the lands acquired (with climate and moisture suitable for

their industries) are deserving of serious consideration. In the breaking up of forest lands as homesteads, a wise provision, has been made, in reserving a certain proportion of these lands as diffused forest, in belts, or boundaries between the several holders. In many cases the necessity of these reserves are appreciated by the intelligent settler, who protects the forest adjoining his lands and increases its value by the planting of trees which will recompense his efforts, by not only affording shelter to his crops, moderating the extremes of temperature in surrounding soil and air (which is lowered during the day and raised during the night), but also in the increased humidity of air and maintaining a favorable degree of moisture in the soil; thus securing more equable climate and surroundings for a high state of agriculture.

Not alone to sugar-cane growers, the enterprising coffee planter, and even the rancher to a certain extent, but to all engaged in any cultivation where products of the soil are his means of support, does the maintenance of forest in a certain proportion mean a matter of the greatest importance.

In the districts of Hilo, but more particularly that of Hamakua and Kohala, for many years the upper-land forests have suffered from the inroads of cattle, with results which are now visible to even the most casual observer. Young seedlings and coppice (or supplemental forest) are entirely destroyed, leaving but the decaying tree-butts, to mark where healthy forest grew. While in place of the little trickling brook we find but an empty channel ornamented with the bleached skeletons of cattle, who had wandered there to relieve their thirst, but only found disappointment and death. At Kukuihaele for the past twelve years, at two elevations correct record of the rainfall has been preserved. The past year shows but a total of 34 15-100 inches at 950 feet elevation, while in former years a rainfall of from 80 to 100 inches was not considered unusual. Periodical droughts may happen here as elsewhere, but apart from this, the opinion of several men who have lived for sixty years in these districts, as well as the careful observations of Dr. Guppy, a student of nature, who a few months ago spent

some time on the summits of our Island mountains, go to show that the rainfall and means of conserving the same is much less than that of years gone by. With the future of Island industries and prosperity of country at heart, is it not then time to consider what course should be pursued to benefit the community; apart from interests of the individual? Where as in the present case forests are necessary to produce climatic and mechanical effects, a wise administration will assure the maintenance and protection of an adequate proportion of the country under such.

In applying the foregoing conclusions to these Islands, I do not, however, overlook the facts, and arguments of many, that through the insular position and exposure to the moist air currents which come direct from the sea, this group is not entirely governed in its rainfall by the area of forest on its mountain slopes. It is beyond dispute, however, that forest is invaluable in the position it bears on the retention of moisture, preservation and regulation of the water supply in springs and rivers, ensuring an even flow and preventing floods; or where the water is in demand for irrigation, etc., to reduce evaporation on the catchment areas. Most of us are aware that where forest has become denuded on the mountain slopes, the varieties of vegetation which survive are not of a nature to help and prepare the soil to retain water for any length of time.

The consequences are, that so soon as a heavy rain falls, it simply runs over the surface to channels on lower ground, in which its way is rapidly found to the ocean.

During the past season in many places along this coast the scarcity of water for domestic purposes was severely felt, so much as, that in several instances importation by steamers had to be resorted to, in order to supply the people's needs.

Considering then the diminishing supply and the ever increasing demand, I believe there is no need of further argument in favor of forest reservation.

I am meanwhile unable to state what percentage of the Islands are now under forest, although, I know the area of protected forest to be decimal infinite. The following table of

forest distribution in several sea bound countries, from which a fairly reliable data is given may be of interest:

Countries.	Percentage of total average of country under forest.	Forest area per head of Population in acres.
East India (British)	25 %	.5
U. S. America	17 "	7 6
Russia in Europe	42 "	6.1
Sweden in Europe	35 "	9.1
Germany in Europe	26 "	.8
Italy in Europe	22 "	.5
France in Europe	16 "	6
Great Britain in Europe	4 "	1

In the above it will be seen the percentage of forest area varies from 42 to 4 per cent., while the area per head of population from 9.1 to .1 acres, showing that the demands for forest in different countries vary considerably. Russia and Sweden may have more than is necessary to supply their wants, while meanwhile U. S. America and India export much of their valuable forest in shape of sawn timber, but they have at last realized the necessity of protection from cattle, fire and woodman's too free use of the axe, and see the necessity of laws to regulate such waste and destruction. Great Britain and even Italy and France have a much smaller area under forest than is necessary to supply their demands for timber, although, from their situation as sea bound countries, limited season of rapid evaporation and entirely different means of water reservation (to these Islands) the climatic effects from their limited forest area are not objectionable.

Much can be said on the existing methods of forest reservation, and regeneration, character and composition of forests, as well as the Sylviculture systems of treatment; but meanwhile such is unnecessary, my object being to renew the attention of all with the welfare of country at heart to the effects of forest vegetation as well as effects of its absence on localities as such in which I am placed. Trusting I may not fail in such an object and thinking with a popular writer, who said—the man who plants a single tree successfully, confers a bless-

ing on mankind and succeeding generations, even if the balance of his life has some what been spent in vain.

Yours truly,

D. FORBES.

(Letter by Mr. K. S. Gjerdrum of Hana, Maui, member of Forestry Committee.)

TO THE HAWAIIAN SUGAR PLANTERS' ASSOCIATION,
HONOLULU.

GENTLEMEN:—The Legislature of 1892 passed an Act to establish and maintain a Bureau of Agriculture and "Forestry," which, as Section 1 says, shall have for its object:

1. The planting of trees for forest conservation.
2. The promotion of an Arbor Day observation throughout the country.
3. The preservation of forests and all kindred subjects.

The agricultural interests of these Islands have received their full share of benefits from this Bureau, but only little seems to have been done regarding forestry, although the different members of the Forestry Committee of this Association in their reports have every year more strongly urged the necessity of the Government taking early and energetic action in this matter.

It appears to me to be unnecessary to again go deeply into the theory of the relation between forests and rainfall when all intelligent and observing people admit that the decrease or increase of rainfall goes *pari passu* with the decrease or increase of the forests. Our rain gauges show us from day to day, and the statistics published by the Government Weather Bureau show us annually, the cold fact of the correctness of the theory, and also the localities in which rainfall has decreased from year to year with the disappearance of the forests. Fifty years ago practically the whole windward side of the Island of Maui was covered with dense forests, containing Koa, Mamane, Aloko, Kou, Ohia, Paihi,

Hau and other valuable trees and an immense undergrowth. At that time rainfall all over the Island of Maui was abundant. Most of the wheat used in California in those days was raised on Maui, and later on sugar plantations were carried on successfully on Maui without irrigation; there was always enough rain. Now it is different. There was a short time last summer when people in some parts of Maui did not have enough water to wash their clothes. The clearing of forest land for agricultural purposes would have had hardly any effect upon the rainfall if the remaining forest had been preserved, but it was not taken care of and is now in a very bad state. People have cut trees in the forests for timber and fire-wood and never planted another tree. Insects, creeping vines and other natural enemies of forests have killed a great many trees, but the greatest enemy of our forests has been and still is the large number of wild cattle roaming all over the easiest accessible and best parts of the forests, killing full-grown trees by rubbing off the bark and absolutely preventing any new growth by trampling it down and by eating it. This destruction of forests is still going on. Everybody says it ought to be stopped, but nobody seems to do anything. Everybody's business is nobody's business. Some districts are now entirely bare, and about all that has remained of the once so grand forest of Maui is only in the uplying and the rough portions of the Island where wild cattle have not ventured to any great extent.

Next to the trouble of the diminished rainfall comes the trouble of the quicker drying up of the water streams after a rainfall. The forest, which not only produces rain, but also retains the rainwater, holding it among its leaves and branches, its undergrowth, its myriads of roots and rootlets and its fallen debris, letting the rainwater trickle down slowly to the water streams and keeping them supplied for a long time; that forest is not there. Rain pours down, the water rushes in torrents through the streams to the sea and soon after everything is dry again. Has anybody ever seen a live stream flow from barren country?

Not enough rain and not enough water in the streams are great evils, but they can be remedied and we all know how it can be done. All parties interested seem to be willing to help, but nobody takes the lead. Therefor, let this Association take the initiative step. Let all the members of our Association stand one by another and do their share on their own lands, and see that all landowners, including the largest landowner, the Government, do their share also. I am convinced the Government will gladly do its share. Let us introduce at the next Session of the Hawaiian Legislature in February, 1898, a bill providing for the setting apart of certain parts of the land for forests, for the appropriation of the necessary money, for the systematical replanting and maintaining of such forests and for the appointment of foresters: these latter to be men who fully understand and have experience in planting and maintaining forests, who must reside in or near the forests in the districts for which they are appointed, who must make quarterly reports to the Government about work done, and whose duty it must also be to enforce the carrying out of all laws on forestry by all property owners. Such laws might also provide that further cutting down of the forest trees can only be done upon certain conditions and under the supervision of the foresters; that a certain number of trees per acre must be planted and maintained by all landowners on land which is not cultivated; that all wild cattle now roaming over forest land is to be captured or killed; that seeds or plants be supplied by the foresters to property owners at actual cost or free, etc., etc.

I would most earnestly urge that it is of great importance to have such a law passed at the coming session of the Legislature in February next, to see that such law goes into effect immediately and that foresters are appointed at once to begin with the work.

Rainfall on Maui and the other islands is growing less from year to year, and the people and agriculture are suffering more every year; therefor the sooner the work on the forests is commenced, the sooner will this suffering be alleviated, and

also the sooner the work is commenced the cheaper will it be to accomplish it.

The decay of the forests is now going on constantly, every day, every hour, and the sooner we commence the more of the trees can be saved.

The expense to landowners will be trifling in proportion with the value of their interests. It may take quite a little sum for the Government, but it will be a good investment. The proceeds from wood and other products of the forests will, after a few years, be much greater than the expense of taking care of them, and besides that, the country at large will have an immense rain-making machine.

In all European countries forests are the source of good income to governments and individuals.

Mr. Forbes and Mr. Marsden, in their former reports, have named many trees that are suitable for this climate and valuable for their wood and their product.

I have had no practical experience in forestry, but I desire to relate an instance which shows how quickly trees will grow in our climate and on our soil. About the middle of last June, Mr. Hugh Howell planted at Nahiku several Ceara Rubber seeds. They were planted during the driest spell that Nahiku had experienced since many years, but they have grown well; they now measure 15 feet in height and 8 inches in circumference. Here in Hana we planted some seeds about six weeks ago and the young trees are now nearly 3 feet high.

I understand that the India rubber product yields a good profit, even when the rubber is obtained from the remotest interiors of Africa and South America, and thus it would appear as if we could plant rubber trees here to good advantage: but this is only one article; there are a great many more.

The object of this report is to again assert that forests are the great rain producers and stream suppliers and to show that our forests may be restored to their former condition within a few years and at a profit to the forest owners.

And I sincerely trust that this Association will not hesi-

tate to appoint from among its members a strong committee who will work with an earnest determination for the prompt framing of the necessary laws, the appropriation of the required funds and the immediate commencement and energetic continuance of the work.

Yours truly,

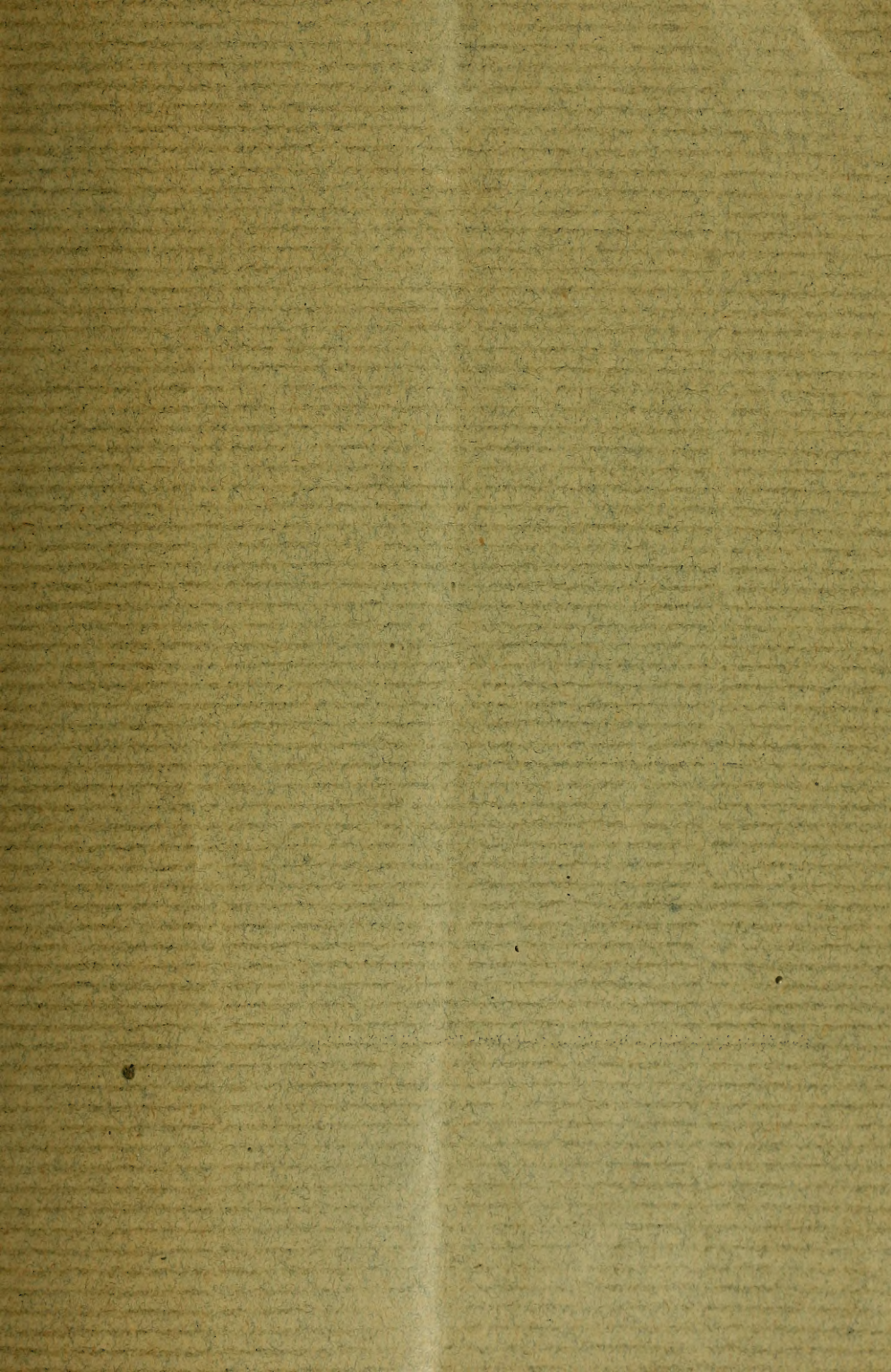
K. S. GJERDRUM.

Hana Plantation, November 19th, 1897.

Whilst numerous suggestions have been made by former Committees with a view to having the Government take up the subject of Forestry systematically, nothing of any moment has been done, and with the concurrence of the members of your Committee, I would now ask that the Association make a motion to appoint a Special Committee of three members,— of which Dr. Maxwell shall be one—for the purpose of interviewing the Minister of Interior and asking him to petition the coming Legislature to appropriate sufficient funds to pay for an expert survey of forest conditions on these Islands on the lines laid out and suggested by Prof. Furnow in the letter above published.

Respectfully submitted,

W. M. GIFFARD,
Chairman Committee on Forestry.



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